Exhibit 8

UNITED STATES DISTRICT COURT
DISTRICT OF NEW JERSEY
MDL NO. 16-2738(MAS)(RLS)

IN RE: JOHNSON & JOHNSON
TALCUM POWDER PRODUCTS
MARKETING, SALES PRACTICES,
AND PRODUCTS LIABILITY LITIGATION.

SUPERIOR COURT OF NEW JERSEY
LAW DIVISION - MIDDLESEX COUNTY
DOCKET NO. MID-L-003809-18AS

KAYME A. CLARK and
DUSTIN W. CLARK,

Plaintiffs,

v.

JOHNSON & JOHNSON, et al.,
Defendants.

DEPOSITION UPON
ORAL EXAMINATION
OF
SHU-CHUN SU
(VOLUME II)

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TRANSCRIPT of the stenographic notes of ANDREA F. NOCKS, a Certified Court Reporter and Certified Realtime Court Reporter of the State of New Jersey, Certificate No. XI01573, taken at THE HELDRICH HOTEL, 10 Livingston Avenue, New Brunswick, New Jersey, on Thursday, July 18, 2024, commencing at 9:12 a.m., Eastern Standard Time.

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SHU-CHUN SU,

having been previously duly sworn, testifies as follows:

CONTINUED DIRECT EXAMINATION BY MR. BRALY:

Q. How are you?

A. I'm fine.

Q. Good to see you again.

A. Good to see you again.

Q. I said no, but it is actually kind of an important point.

You understand that you are still under oath from the last time?

A. Understood.

Q. Great. So you're going to tell me the truth?

A. Yes.

Q. Good; 'cause otherwise, we would have a real problem.

A. Sure.

Q. Have you conducted any additional analytical experimentation or evaluation of the issues pertaining to either the Clark case or the MDL case since our last deposition?

A. No.

Q. Okay. I want to talk to you a little

bit about the Becke line method of refractive index calculation. Okay?

A. Okay.

Q. It is a true statement that the dispersion staining method is a method to determine the refractive index of a particle, correct?

A. Is what method?

Q. That's a true statement, that it is a method?

A. One of the methods.

Q. Yes.

There's another method that's called the Becke line method for determining the refractive index of a particle, correct?

A. Correct.

Q. What I gathered from our last meeting was that you are taking the position that when you do dispersion staining, when you're looking at the colors under the polarizer, that you have to switch the objective to the Becke setting and evaluate where on the particle the Becke line matches the refractive index fluid, or most closely matches the refractive index fluid?

A. I should say it is not to find the Becke line matches the color, it is to find out

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where is the true Becke line and the dispersion staining color.
Q. Okay.
A. The dispersion staining color, they are corresponding. Like you say, you have a series, a range of the color, dispersion staining color. Now, which one is the one we're presenting the true "refract" index. You would have to switch the Becke line to examine the Becke line characteristics to determine which color --
Q. Okay.
A. -- is present in the true refract index.
Q. So, when you say you have to switch, you're talking about switching the setting in the objective, which is a piece of the microscope?
A. That's right.
Q. To remove what's called the central stop?
A. That's right.
Q. Right.
What you're describing is not the Becke line method of determining the refractive index 'cause that's a completely separate methodology, right? It's using the Becke line

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setting to help confirm the dispersion staining method?
A. No. So-called, the Becke line setting is in order to observe the Becke line, like the dispersion staining setting is for the observing the dispersion staining color. You see? The setting and the method, it's part of method, it's not just change the setting; it change the test method.
Q. So, when you perform this, when you switch the objective from central stop to the Becke setting, or the no-stop setting, I suppose is what it is --
A. Um-hum.
Q. -- are you saying that you're utilizing a completely separate method to confirm the other method?
A. That's right.
Q. I did a review of your entire report, the report that you issued in May, and the word "Becke" appears twice, and they're both in your article list, your list of references.
You would agree that nowhere in your report do you provide a criticism of Dr. Longo relative to some supposed failure to use the Becke

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line method?
A. Could you say question again?
Q. Yes.
A. Please.
Q. Nowhere in your report do you discuss utilizing the Becke line method to confirm or to critique the analysis that Dr. Longo performed in his dispersion staining analysis?
A. I don't have to, because he said he's a self-taught polarized light microscopy expert. Any expert should know that. It's, like, common knowledge. Yeah.
I only said his determination using the dispersion staining technique is incorrect.
Q. Where he takes the color based --
A. That's right. I don't have to point out where he's incorrect. Okay.
Q. No, no, no. I get it. You think he's wrong, you're saying that you don't have to point out exactly how he's wrong.
A. That's right.
Q. And of course, Dr. Longo is taking the position, I suppose, that the color at the edge, or the border of the fluid and the particles where you should be reviewing the coloring, you think

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that's wrong?
A. Now you mention color. Let me make it clear, color does not identify mineral, does not identify any mineral, including asbestos mineral. Color is not a intrinsic property.
Q. I understand.
A. Refract index is. You see, there's no literature, no methods, whether EPA, ISO or ASTM, they identify, describe, asbestos by color. Okay?
Q. But that's not what I asked you.
A. No, no, no. I want make -- because I --
Q. I want you to answer my question.
A. Yes. That's what I'm answering, the color question.
Q. You're not. I know the color corresponds to wavelength. I know this. That's not what I'm asking you.
A. What wavelengths?
Q. Yeah.
A. What wavelengths?
Q. That you can take the color and compare it to a chart that you've developed to determine a range of wavelengths --
A. What wavelengths, the question is.

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This a very central issue of this debate.
Q. I'm not debating with you.
A. No, no, no, no. A discussion, the central --
Q. Doctor, please. I'm just asking you questions.
A. Yes.
Q. I'd appreciate if you'd focus on the question I'm asking.
A. I am focusing on the question.
MR. HYNES: Let him finish the question.
BY MR. BRALY:
Q. Let's start over.
All I was trying to get at is that Dr. Longo evaluates the image at the border of where the fluid and the particle are coming together, at least that's what he said, and you disagree with that as a methodology for identifying what it is that he's looking at?
A. No, I'm not disagreeing with that. I said his methodology is wrong; he was not correctly performing the technique.
Q. Okay. One of the ways that he was not correctly performing the technique is because he

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didn't utilize this objective switch to the --
A. No, no, no. I never --
Q. Let me finish my question.
A. Okay. Sorry.
Q. One of the ways that you believe he was incorrect is because he didn't follow the methodology of switching to no-stop in evaluating where the Becke line was?
A. No, I'm not saying that. I'm saying that -- I said he is incorrectly performing the dispersion staining technique; I didn't say he did not switch. Because it's not tutorial. I don't have to tell him what -- how to -- what's the correct way to performing the technique.
Q. I have a series of articles that you published that I want to talk to you about briefly.
A. Okay.
Q. Like before, let me get set up.
Exhibit 34 is going to be an article that you published in "American Mineralogist" in 2003 --
A. Yeah.
Q. -- called "A Rapid and Accurate Procedure for the Determination of Refractive Indices of Regulated Asbestos Minerals."

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I take it you're familiar with this?
A. Yes, that's my paper.
Q. Yes.
In this paper, you do not discuss using Becke lines or the Becke line method to confirm what you're looking at by dispersion staining, correct?
A. I don't have to.
Q. Just answer my question.
A. Yes, I did not, because I don't have to. Okay.
Q. So, for an analyst or somebody reviewing the peer-reviewed literature, they would have no idea based on this paper from 2003 that you believe that you should confirm what they're seeing by dispersion staining by doing a Becke line analysis?
MR. HYNES: Calls for speculation.
THE WITNESS: Can I answer the question?
MR. HYNES: Yeah, you can answer the question.
A. If a analyst using the dispersion staining technique to determine a refract index, if he is a trained analyst, he should know how do you

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need to distinguish the normal dispersion staining color from the distorted dispersion staining color. And he should know, in many cases he's trained, he should use the other method to distinguish that, which Becke line is the most effective method.
Q. Have you ever published that a dispersion staining analysis should be coupled with a Becke line analysis in order to confirm what it is that's being looked at by dispersion staining?
A. No, I don't have to. Okay.
Q. You don't have to because you presume people should know if they're well-trained and run a good lab?
A. Not well-trained. If you are trained, you should know because Becke line is the first technique to determine refract index. Dispersion staining technique came later in 1930s, okay, but Becke line was developed way before that. Anyone who is a trained analyst using polarized light microscopy determine by refract index should know that, should know both technique, and should know when do you use the technique to confirm each other.
Q. Okay. In your work for NVLAP, N-V-L-A-P -- your work for NVLAP, you accredited --

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you personally accredited MAS as a PLM laboratory that performed PLM analysis in ways that were in accordance with standards?
A. No.
Q. You did not?
A. I did outside assessment. I don't have the power to accredit any laboratory. NVLAP, they have the power. I only report. My assessment is either determination whether they received accreditation or not. It was NVLAP; it's not me. I don't have that power.
Q. Exhibit 35 is a document dated September 9, 2016, titled at the top "NVLAP On-Site Assessment."
Do you see that?
A. Yeah.
Q. That's your signature on the bottom right?
A. Correct.
Q. What were you doing here?
A. I did the -- I follow the protocol, NVLAP protocol, to assess the managerial and technical management of the laboratory, which now for this one is MAS. I'm assessing whether they are capable to following, to comply with the managerial

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requirement and technical requirement set out by NVLAP. That's my job.
Q. And you were performing this analysis -- you were performing this analysis on behalf of NVLAP?
A. Assessment.
Q. Right?
A. Yeah. Yes.
Q. I mean, you don't take this lightly, do you?
A. No.
Q. There is an error in this, the attached -- if you'll flip through them, it's missing, I think, pages 14, and I think another page. I have another exhibit that I can get for you.
A. Which, page 14?
Q. If you'll flip through it, there's 17 pages attached to it. You'll see --
A. No, the even page was missing. You want to print it --
Q. I'm saying I have the full thing. I am just marking -- here you go. (Handing.)
This will be Exhibit 36. It's the full list of the evaluation from NVLAP.

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A. Yeah.
Q. Okay. So, in 2016 this is the evaluation that you conducted at MAS, correct?
A. Correct.
Q. And my colleague, Mr. Placitella, would tell me this is God's way of telling me I've been talking too much.
It includes -- again, back to Exhibit 36, it includes on page 2 a section on proficiency testing, correct?
A. Page 2, yeah, proficient test, yes. Yep.
Q. Actually, it was the other document I was pointing to.
A. Yes.
Q. And you conducted proficiency testing of MAS in 2016 specific to the way they were doing the PLM?
A. Let me make it clear: The proficient testing -- proficiency testing in the 3.4 clause is not what I did in the lab. That proficient testing is a formal testing issued by NVLAP twice a year, like M1 2015, M2 2016. This testing, you see the title --
Q. I wasn't asking you about that

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document. I wasn't asking you about that document.
MR. HYNES: Let him finish the answer, please.
A. But you're asking the testing I did.
Q. No, I didn't. I asked you on page 2, it lists requirements for --
A. Okay.
Q. Let's try to stick to the question I'm asking.
A. Okay.
Q. I said on page 2, it lists proficiency testing.
A. Correct.
Q. Okay. If we go to page 7 of Exhibit 36, page 7 of 17 --
A. Page 6?
Q. Seven.
A. Seven? Okay.
Q. Section 5.3 there's a section called "Accommodation and Environmental Conditions," correct?
A. Yes.
Q. And the Section 5.3.2 talks about "The laboratory shall have procedures for the use of blanks and asbestos-free material to determine the

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presence, quantity, and consistency of asbestos contamination in their analytical processes and have related procedures to control it."

Do you see that?

A. Yes, I do.

Q. And you evaluated this in 2016 as "ok," correct?

A. Correct.

Q. Which means it passes?

A. Correct.

Q. For NVLAP certification?

A. Correct.

Q. And that's something you evaluated personally?

A. But not about accreditation. As I said, I only evaluate following this checklist. NVLAP has the power to determine whether they pass or not.

Q. This was the -- so when it says "ok" here, that was based on the information that you reported to NVLAP, correct?

A. Correct.

Q. Right.

And they said they passed?

A. What I'm saying, the "ok" here only

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means they are in -- complied with this requirement; NVLAP said whether they pass or not.

Q. Okay. Go to the next page, page 8.

A. Okay.

Q. Test and calibration methods in method validation 5.4.1: "The laboratory shall use the US EPA interim method for the determination of asbestos in bulk insulation samples." That's found at 40 CFR Part 763.

Do you see that?

A. Yes, I do.

Q. Again, you performed this evaluation?

A. Yes, I did.

Q. And NVLAP okayed it, correct?

A. That's right. NVLAP okayed it.

Q. Based on the information you reported back to them?

A. Correct.

Q. Okay. Go to page 13 of 17.

A. 13?

Q. Yes.

A. Okay. 13.

Q. There's a section called "5.9"?

A. Correct.

Q. Assuring the quality of test and

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calibration methods.

Do you see that?

A. I see that.

Q. What does the letter C mean in this analysis?

A. Comments.

Q. Okay. Do you know where the comments are?

A. Yes. I said 5.9.1, I think they comply with this requirement from minimum 10 percent QA, and listed here QA rate. The QA rate by this lab meet -- meets this minimum 10 percent requirement. Comments in the NVLAP system, comment is not a nonconformity; it is only document the assessor's observation, okay? Yeah.

So, comments is not criticism, what I'm saying is, just to show what the lab did is correct.

Q. So the comments are your actual comments from your review at MAS in 2016?

A. Yes.

Q. So, when we get to 5.9.5, which is found at page 14 of 17, Section -- I'm sorry.

A. 14, yes.

Q. 5.9.5.

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A. Yep.

Q. The section is labeled "The laboratory shall maintain and summarize all of the quality assurance activities at least monthly to include..." and then it includes the list of things to include, correct?

A. Correct.

Q. One of those is, under I, is the total qualitative error rate of the laboratory.

You see that?

A. Yes, I saw that.

Q. On the last page for comments, you marked "Monthly Summary: Well Done."

A. Yes.

Q. Okay. You were there specifically to determine MAS's compliance against a NVLAP checklist pertaining to their PLM methodology, the way they run their lab?

A. Correct.

Q. And NVLAP passed them, correct?

A. Correct.

Q. Based on the information you reviewed and provided to them and signed your name to?

A. More so based on the reviewer. The NVLAP procedure is such. They sent a assessor to

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the lab informing the lab how the assessor's biography. The lab get to determine whether they accept this assessor or not. So, when they accept assessor, the assessor comes to the lab to do the assessment, then turn in the assessment report like what I did.

However, there's one more step. The NVLAP will assign another assessor to review the report. If the review report is okay, then NVLAP determine whether they will grant the accreditation or not. So, it's based on not only my report, but a second step, that the reviewer's review.

Q. Okay. So somebody reviewed the information you provided?

A. Correct.

Q. And NVLAP approved MAS with regard to their PLM microscopy?

A. Correct.

Q. I want to turn back to the Becke line discussion briefly.

A. Okay.

Q. If I understand it correctly, you agree that your report in no place discusses the application of a Becke line methodology to dispersion staining analysis, but you believe that

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people should just know that if they're a quality PLM analyst?

A. Which report? You mean my MDL report?

Q. The only report you've issued in this case.

A. Okay. Yes.

Q. That's Exhibit 3 to this deposition.

A. Okay.

Q. In your published papers, and I could show you examples of this if you'd like, you refer to dispersion staining and a Becke line analysis as two competing ways to determine the refractive index of a mineral, correct?

A. Incorrect.

Q. Okay.

A. I never said they are competing. Actually, they work in concert.

Q. I'm going to hand you an abstract from 2005 that you published.

A. Yes.

Q. And this will be Exhibit 37. Let me get this taken care of.

Are you familiar with this abstract?

A. Yes.

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Q. What it says in the first paragraph is, "Although both Becke line and dispersion staining can be used to determine refractive index of a solid immersed in an immersion oil, dispersion staining has several advantages complementary to the Becke line method that makes it a versatile alternative technique for refractive index determination using the immersion method," correct?

A. Correct.

Q. You're identifying dispersion staining as a completely separate technique for determining refractive indices, correct?

A. Correct. It's not me to decide, to determine what it is because, in fact, it is one of the method to determine refract index.

Q. So, going to Exhibit 13 -- do you have it in front of you?

A. Yes.

Q. Okay. Great.

So, going to Exhibit 13, if you'll turn to -- it's paginated as page 53.

A. Okay.

Q. Yeah.

A. 53. Yes?

Q. And this is a 2022 article that you

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published, I believe in "The Microscope," correct?

A. Correct.

Q. At the top of page 53 you state, "There are three common techniques for assessing the sign and magnitude of the match/mismatch between a solid and its surrounding liquid: Becke line, dispersion staining, and oblique illumination. Only the dispersion staining can meet the above specific needs for the routine PLM analysis of bulk asbestos samples in commercial environmental laboratories."

That's what you wrote in 2022, correct?

A. Correct.

Q. You do not write anywhere in this paper that the Becke line method can confirm where an analyst should be looking on a particle to determine the reference to analyze, correct?

A. Correct.

Q. In fact, this paragraph is the only time Becke is mentioned in that -- in this entire document?

A. Correct.

Q. Last year, in 2023, you published an article entitled "The Unification of Becke line and Dispersion Staining Techniques for the Determination

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of Refractive Index of Non-Opaque Materials," correct?
A. Correct.
Q. Do you remember when this was published in 2023?
A. I forgot which month.
Q. This will be Exhibit 38.
So, in this paper from 2023, if you'd turn to the third page, which is page 101 --
A. Yes.
Q. -- we see the three objective settings.
A. Correct.
Q. Central stop, annular stop, and then no -- no stop, or regular objective, correct?
A. Correct.
Q. This is the first published paper that I have seen from you that illustrates all three settings as opposed to just central stop and annular stop, correct?
A. Correct.
Q. If we continue in this paper to page 108 --
A. Yes.
Q. -- there is a series of images which

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compare the CSDS against a Becke line image, correct?
A. Correct.
Q. This is the first time, that you're aware of, that this methodology has ever been published, correct?
MR. HYNES: Vague; overbroad.
A. No. I only says that's the first time Dr. Gunter take the picture.
Q. Are you aware of any other published literature saying that you should utilize the Becke line method in conjunction with the dispersion staining method to determine the refractive index of a mineral?
A. I don't have to.
Q. So the answer is no?
A. No.
Q. Okay. Thank you.
A. No.
Q. If we continue to page 110, we see Figures 9 and Figures 11. Figure 11 is the three-mode dispersion staining, which I believe is the same thing that you brought with you on the first day of this deposition.
A. That's correct.

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Q. Figure 9 are three separate images of what an analyst can find when conducting a Becke line analysis, correct?
A. That's right.
Q. And then if you'll turn to page 112, in the acknowledgments, you state, "The critical contributions from Professor Emeritus Mickey Gunter, University of Idaho, especially the superb suites of Becke line and dispersion staining colors at various matching wavelengths that he meticulously obtained from a heating stage, have significantly improved this paper and are deeply appreciated.
"I would like to also express my thanks to Dr. Bryan Bandli at RJ Lee Group for his detailed and constructive review of this manuscript."
You see that?
A. Yes.
Q. I may be mistaken, but I thought last week when I deposed you, you had said that you didn't know Bryan Bandli except for a meeting in Chicago that had occurred some years previously.
MR. HYNES: Misstates prior testimony.
A. No, I think the first time I met him

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is in Chicago; I did not say I have never interact with him after that.
Q. Okay. This paper in 2023, you collaborated with Dr. Gunter who you've known for 40 years, and Bryan Bandli, correct?
A. No. I sent him for review.
Q. That's collaboration.
A. That's right.
Q. So the answer to my question is yes?
A. I didn't -- I don't know what you mean "collaboration" but --
Q. I'll rephrase it.
For this paper in 2023, you worked with Bryan Bandli and Mickey Gunter to publish this paper, correct?
A. I wrote the paper, then I sent him for review to get their feedback. That's it.
Q. Okay. Have you maintained a working relationship with Matt Sanchez after your initial meeting with him that you discussed last week?
A. I don't know how do you define a working relationship, but I did work with him. Okay.
Q. What else have you worked with Matt Sanchez on?

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A. I think in June.
Q. The Pittsburgh project?
A. Correct.
Q. I'm not talking about the Pittsburgh project. Other than the Pittsburgh project, what else have you ever worked with Matt Sanchez on?
A. Never, I don't think so.
Q. Other than the Pittsburgh project and this paper in 2023, what else have you ever worked with Bryan Bandli on?
A. I think I sent him a paper about the dispersion staining color manuscript for him to review.
Q. Okay.
A. That's the only -- the other so-called working relationship.
Q. Have you had interaction with any of the other scientists or microscopists at the RJ Lee Group other than Mr. Sanchez -- Dr. Sanchez and Dr. Bandli?
A. Well, when we were working in the RJ Lee lab last June, like Monica, she was providing, like, logistic support for us.
Q. Okay. Other than for the Pittsburgh project, other than that, have you ever had any

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other interactions with other scientists who you knew to be affiliated with the RJ Lee Group?
A. No.
Q. Tell me about -- what is your view on Walter McCrone with regards to the proficiency of establishing standards applicable to polarized light microscopy?
A. He is a well-respected scientist.
Q. Did you know Dr. McCrone?
A. Yes, I know him.
Q. Do you rely on his work?
MR. HYNES: Overbroad.
A. What do you mean by "rely on his work"? I have never -- you see, the only thing I refer to his work is the 1967, the dispersion staining color chart. And that's the 1967 paper. And I don't remember which paper, I cite another reference from Dr. McCrone.
Q. You understand Dr. McCrone to be a well-respected imminent scientist in his field, at least until he passed away, correct?
A. Yes.
Q. I'm going to hand you a publication by Walter McCrone called "Asbestos Identification."
A. Yes, I know this.

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Q. You know this?
A. Yeah.
Q. Okay. It's just an excerpt, but if you'd turn to the next page -- turn to the next page.
A. Okay.
Q. This is page 83 of this document.
You see in the second full paragraph -- by the way, did I mark this Exhibit 39? This will be Exhibit 39.
The second full paragraph states, "The matching wavelength is represented by color borders on the particle of interest."
Do you see that?
A. Yes.
Q. Okay. What Dr. McCrone says here is that the matching wavelength -- which is a term that Dr. McCrone invented, correct?
A. No.
Q. No? Okay. I thought --
A. I said already, invented by a Russian microscopist called Cherkasov in 1930s.
Q. Okay.
A. Dr. McCrone referred to his paper.
Q. All right. I thought maybe you had

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published something differently, so I'll re-ask the question.
"The matching wavelength" -- which is what it is that you're trying to identify in polarized light microscopy, correct?
A. Correct.
Q. -- "is represented by colored borders on the particle of interest."
That's what he wrote, correct?
A. Correct.
Q. Okay. Dr. McCrone did not write that you should utilize dispersion staining with a Becke line analysis ever that you're aware of, correct?
A. Correct.
Q. All right. I'm changing topics now.
A. Okay.
Q. I'm going to ask you about Michel-Levy charts for just a moment, and then I think we can probably take a break. Okay?
A. Okay.
Q. All right. So, Michel-Levy charts are a method for determining the birefringence of a particle, correct?
A. Correct.
Q. It's not the only method, but it is a

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method, correct?
A. Yes, one of the method.
Q. I'm going to have to put this one on the screen, I think, but this will be Exhibit 40. And it is just a -- I broke the computer. Make this bigger.
Exhibit 40 is an example of a Michel-Levy color chart, correct?
A. Correct.
Q. So birefringence is determined by the relative refractive indices in the gamma and alpha directions, correct?
A. Correct.
Q. Okay.
A. But, it was not used by Michel-Levy chart. Michel-Levy chart never used that.
Q. No, I understand. The Michel-Levy charts don't calculate birefringence that way because it's a reference chart. You reference a viewed color and you compare it to the chart given other parameters, correct?
A. There's two way to determine birefringence: One is Michel-Levy chart, another is by determine the absolute refract index of gamma and alpha. This is two separate methods.

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Q. I very much understand that. Okay.
A. Yeah.
Q. What I'm saying is, scientifically, birefringence is determined by the refractive index of the particle that you're analyzing, correct?
A. It was determined, but it's not principle of Michel-Levy chart. I have to make very clear about that.
Q. We're missing each other entirely.
A. Okay.
Q. All right? Birefringence is a reflexion of what the refractive index of the measured particle is, just conceptually, right?
A. Correct.
Q. In the Michel-Levy charts, on the left-hand X axis, I guess it is, it's a vertical axis, right, the X axis? I always mess that up. But on the left-hand side, the Michel-Levy charts lists different values depending on the thickness of the particle?
A. Correct.
Q. Is this indicative of the proposition that various thicknesses of a particle can distort light at different rates and, therefore, have different refractive indices?

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A. No, not at all. You know the history of this chart was developed by petrologist. At that time, at early age, people don't measure birefringence by locating particle because when you examine the petrographic thick section, the standout thickness is 30 micron. So it's a uniform thickness on glass slide.
Where you try to identify a rock, what type of rock, was it volcanic or sedimentary, you always cut a rock into 30-micron thick slices; therefore, you see this 30 is in the middle, not the standard thickness, to determine birefringence using the Michel-Levy chart.
The chart has other thickness. It doesn't mean it would change the refract index, the thickness related to the birefringence. The thicker the thickness, the higher the birefringence.
Q. Okay.
A. Another important issue is --
Q. Go ahead. I'll leave that up.
A. Here it says, like in the down indicate .0.05. That's the birefringence. It could be the mineral 1.65 gamma, alpha 1.60.
Q. Um-hum.
A. It could be another mineral. It's

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alpha is 1.50, but its gamma is 1.55. So, this chart is unrelated to the gamma and the alpha.
Q. Okay. Because that's a separate method of calculating --
A. That's right.
Q. -- birefringence?
Doctor, you have to let me finish my question.
A. Okay. Sorry.
Q. You can continue.
A. So this chart was developed specifically for the petrologist looking for the thin section. It's not for the particle identification because you don't know the accurate particle thickness.
Q. Okay. So, let's talk about thicknesses and refractive indexes for a minute.
A. Um-hum.
Q. You've seen that I use reading glasses. Reading glasses distort the light going to your eyes, correct?
A. That's right.
Q. They have a refractive index?
A. Correct.
Q. The glass in your reading glasses has

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a refractive index?
A. Correct.
Q. If I make that glass thicker, it will distort the light more, correct?
A. Depending the refract index of the glass.
Q. Right.
A. If the refract index is the same, no, the reflection angle is the same.
Q. Right.
A. It does not change the refract index of the glass.
Q. When you change a prescription in your glasses, you are changing the refractive index of what is being fed to your light -- to your eyes through the glasses, correct?
A. No, no, no. The "prescript" lens is the curvature at the angle of incident and refracted. So the thickness, if the same material, same glass, whether it's glass, or later which people use polycarbonate, the plastic, okay, and the plastic has a high refractive index; therefore, make the lens thinner, which is good for the wearer.
Q. Okay. If you have a mineral that is bundled, where there's multiples, individuals of

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that mineral, stacked on top of each other.
A. Yes.
Q. And each of them have the same refractive index. Okay?
You with me so far?
A. Yes.
Q. Would the bundle not distort the light more than a thinner section of that same bundle?
A. Yes.
Q. Okay. Isn't the refractive index a measurement of the degree to which light is distorted through the particle? Isn't that what it is?
A. No.
Q. No?
A. "Distorted" is not a "terminolog" in this science; reflection is. So, the light is refracted by the fiber or the individual component of a fiber bundle; therefore, it is a fact by the interface between the fibers because the interface angle would affect the reflection. If happen, the interface incident angle to interface is at the critical angle, or exceeding the critical angle, that wavelength will be internally totally refracted

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out of the microscope.
So, it's like, for example, the blue light has 86.5 degree of critical angle for the 1.55 oil and the typical 1866 chrysotile, okay? For the red light is 83.5 degree. Whenever it interface, the angle with the incident light is at the critical angle; for example, for the blue wavelength, which are 86.5 degree, if I remember correctly, then that blue wavelength will be totally refracted. Okay?
Q. A fiber of a given refractive index will distort light differently than a bundle of those same fibers even if those same fibers all have the same refractive index, direct?
MR. HYNES: Incomplete hypothetical.
A. Yes and no. It doesn't matter it's a fiber bundle or single fiber. Even if single fiber.
The best example is the glass. See, in order to meet NVLAP requirement for asbestos lab, I develop a method to calibrate the oil, use the Cargille glass standards. The glass are single particles, however, the edge, sometime they're very steep, very sharp; therefore, a single particle will show distorted dispersion staining color. That's why my method has been widely used by asbestos labs.
So when I go to the lab, they ask me:

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How come this glass is supposed to be uniform refract index, for example, calibrate 1.550 is immersion oil, use it at 1.55 glass? They're supposed to match very well. However, how come I saw a range of dispersion staining color? Like one of the picture I took in Pittsburgh.
Now explain to them: Well, it is the total reflection. If a single particle, if the interface -- for example, what I'm saying is, like, this steep, the incident light coming from the light source, if the angle is exceeding 86 or 87 degree, then the blue wavelength will be totally reflected.
In that case, the dispersion staining color was distorted because some component of the wavelengths is missing due to the total reflection.
COURT REPORTER: Reflection?
A. Reflection, therefore, it doesn't matter it's a single fiber or fiber bundle. It's all determined by the "morpholog," by the interface angle.
MR. BRALY: Should we take a break now?
MR. HYNES: Sure.
(Recess: 10:11 a.m. to 10:18 a.m., Eastern Standard Time.)

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BY MR. BRALY:
Q. Dr. Su?
A. Okay.
Q. One of the myriad complaints you have with Dr. Longo's PLM testing has to do with the size of the particles and their conformity with each other.
You follow what I'm saying?
A. Yes, I did.
Q. And I guess the top-line criticism here is that if it were truly chrysotile that he's finding in these samples, that the chrysotile itself would not match the size of the talc particles in the samples?
A. Yes, that was my opinion.
Q. Okay. And that is based on a milled sample of -- this is a milled sample of 1886 -- or 1866 SRM chrysotile, correct?
A. Yes and no, because I examine the Calidria chrysotile-spiked sample.
Q. Um-hum.
A. Okay.
Q. Okay. So it's --
A. It's consistent. Okay. Whether it is 1866 or Calidria, the particle size is not as

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small as the talc.
Q. You would agree that there are certain advantages that transmission electron microscopy can provide over TEM, such as a spectra of the chemical composition in the crystal structure of the mineral you're looking at; true?
A. Yes. The TEM method can determine the elemental composition of a object by EDX technique.
Q. So you could have assurances that what it is that you're looking at is the same as the chemical composition of what it is you believe it is that you're looking at, right?
A. Correct.
Q. Your report seems to suggest that the fiber lengths associated with chrysotile will be much longer, on the order of, oh, in some cases, 30, 40, 50 more microns in length, correct?
A. Correct.
Q. Are you aware that MAS has conducted a TEM analysis of Calidria and found that that's not correct?
A. I'm not aware, because --
Q. I'm handing you what's marked as Exhibit 41.

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I have a copy for you, Kevin.
If you can hand that down to Mr. Hynes.
Exhibit 41 is an October 5, 2023, TEM analysis of length dispersions of sample Calidria.
A. Yes, I look at the report.
Q. You're seeing a lot of lengths reported here that fall under 10 microns in length, correct?
A. Correct.
Q. That's inconsistent with what you reported in your PowerPoint, correct?
A. Also inconsistent with the work I did in Pittsburgh. I took SEM picture, those structure, the SG210 of the SEM, which is equally accurate for the length determination. They are much larger than the report by MAS.
Q. Okay. Well, this is page 4 of Exhibit 41, if you look at the monitor. You could do it on your page, too, if you wish. But it's the first TEM photomicrograph here. We see a bundle of what's reported as RG210 -- there is no RG210, so it's probably a typo, SG210 -- top 001 chrysotile reported length of 2.7 microns.
Do you see that?

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A. Yes, I saw that.
Q. That's inconsistent with what you found in your Pittsburgh project with Mr. Sanchez and Mr. Bandli, correct?
MR. HYNES: Form.
A. Correct.
Q. If we scroll ahead, it's page 12 of the PDF but it's the next image here, and this is reported as Calidria RG144, which is a different grade than SG210.
You see that?
A. I saw that.
Q. Which is a -- you would agree this is a bundle of chrysotile fibers, right, presuming the EDXA all matches in the chrysotile spectrum would match, that this is visually a bundle of fibers, correct?
A. I don't know how accurate this image is. I would love to look at fiber myself.
Q. Okay. But this is reporting RG144 as a length of 2.1 microns, correct?
A. Correct.
Q. Which is inconsistent with what you found by polarized light with Matt Sanchez, correct?
A. By the way, you said is 2.1 micron.

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Where is the scale bar? Without scale bar, I cannot say it is 2.1 micron.
Q. You don't trust the software utilized with TEM to --
A. No. The TEM -- no, I'm not say I'm not trusting it, but I have to look at the scale bar.
Q. Sure. Sounds like you're saying you're not trusting it.
A. And also, one issue here is if you look at that, the width is .1.
Q. Sure.
A. The length at 2.1.
Q. Um-hum.
A. You said the length 21 times than the width.
Q. Sure.
A. Does that look to you like 21 times?
Q. Yes, it does.
A. I can measure off the screen --
Q. I think anyone with a set of eyes can see that's about 21 times the length.
A. Doesn't look that to me.
Q. Okay.
A. Okay. I think the ratio, the aspect

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ratio, is larger than 21.
Q. Okay.
A. Um-hum.
Q. All right. Take it up with the manufacturers of the software, I suppose, but...
A. And didn't even say what magnification on this -- the TEM --
Q. Do you remember the question I asked you?
A. Yeah.
Q. The question I was asking you was, 2.1 microns in length would be inconsistent with what you found with Dr. Sanchez, correct?
MR. HYNES: Form.
A. What I'm saying is --
Q. Just answer my question, please.
A. I'm answering.
Q. Thank you.
Is the answer, yes, it's inconsistent with what you found with Dr. Sanchez --
MR. HYNES: Form.
A. Their data is not consistent with Dr. Sanchez.
Q. Very good.
A. It's not Dr. Sanchez inconsistent

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with him, MAS. Okay.
Q. On page 28 of the PDF, we see another image. This is reported as Calidria RG210 again. I believe that's a typo because I don't think there was ever an RG210, but it's reported as the middle.
This is 002 chrysotile reported as 1.7 microns by .18 microns.
Do you see that?
A. I saw that.
Q. You agree visually that would be a bundle, correct?
A. Yes.
Q. Okay. So, as far as size distribution goes, you and Dr. Sanchez and Dr. Bandli did not find sizes of Calidria that were in the size range of what I just showed you, correct?
A. Incorrect. We found similar size, but we found size much bigger than that.
Q. Okay.
A. Also, the USP study, that is the best particle size distribution of the spiked chrysotile versus talc. Actually, you cannot use a single, or several images to show the particle size distribution. They plotted the two curves. The

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peak of talc is smaller than the peak of chrysotile.
Q. Okay.
A. That is the true particle size distribution.
Q. Listen, if I want you to talk about the USP study, I'll ask you about the USP study. Okay?
A. Yeah.
Q. So, just so I understand this correctly, you did find Calidria samples in what you evaluated that were under 10 microns in length, correct?
A. Yes.
Q. The USP particle size study that you're referencing, this was primarily undertaken by Dr. Sanchez, correct?
A. I don't know. I really don't know. I don't know who perform, but I know one of the probably investigator is Julie Pier, okay? I have never communicate with Dr. Sanchez about USP study.
Q. You don't know if Dr. Sanchez was involved in the USP study?
A. No, not at all. I know Julie Pier is.
Q. Do you know what Julie Pier's role

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has been relative to talc manufacturing interests?
A. No.
Q. You don't?
A. Oh, I know she used to work for like --
Q. Imerys?
A. Yes. Correct.
Q. Right.
A. Yeah.
Q. I want to ask you about a particular slide in your PowerPoint. And this is page 45 of Exhibit 3, but it's page 25 of your PowerPoint. Okay?
A. Okay.
Q. You've entitled this slide "MAS's Inability to Create Scale Bars."
You see that?
A. Yes, I did.
Q. And you've taken the selected image for both of these photographs and extrapolated out that that image represents the entire field of view available to the microscopist, correct?
A. Correct.
Q. Again, you're unaware of whether or not the software utilized by MAS allows the analyst

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to take a screen capture of just the area they're focused on as opposed to the entire field of view, correct?
A. Yes and no. First, it doesn't matter you crop image or not. You see the top particle on this two images, they are similar. That is impossible, which means the field of view scale is incorrect.
Q. You said that the size of the particle is -- you understand that these are different particles in each of these photographs, right?
A. They are different samples, but they are talc. There's no difference between the particle, the identity of particle.
Q. Fine; but you said that based on the size of the image that's presented here -- first of all, you don't know what the field of view for either of these images was, correct?
A. I know because I measure the --
Q. Image?
A. -- image.
Q. But the image was cropped. You don't know what the total field of view was that the microscopist was looking at, do you?

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A. However --
Q. No, just answer my question first, then do your "however."
A. Okay.
Q. Answer my question.
A. No.
Q. Okay. Now you could do your "however."
A. Yes. They mark the particle size.
Q. Right.
A. Which is indicative, at least the current field of view. This two field of view based on their own data, not my data. For example, the first one, the width of the particle was marked 46.7 micron, micrometer; therefore, you can calculate the field of view whether it's cropped or not. So this 81814 is based on the MAS data.
Q. It's based on a visualization based on the size of the cropped image that you were given to look at.
A. You don't know it's cropped. Do you know?
Q. You don't know either.
A. That's right.
Q. But what I'm saying -- I do know,

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actually, but you don't know. But you're basing that 814 on a visual extrapolation of what was reported as 46.7 taken over the width of the image that was provided to you, correct?
A. Correct.
Q. You don't know if that was the whole field of view?
A. I don't have to.
Q. But you don't.
A. I don't.
Q. Thank you.
The same is true for the bottom photo. You have a scale bar there, and you utilize that scale bar across the width of the image that was given to you, but you don't know if that was the entire field of view that the analyst was looking at, correct?
A. Correct.
Q. Thank you.
A. However --
Q. Go ahead. You're entitled to do your "howevers."
A. I was not based on my evaluation simply by looking at the scale bar or the particle size marked by MAS. I also base my observation, my

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opinion, on the size of the talc particle in both image. If those two field of view is so much different, how could the talc particle there look similar?

See, that's another criteria you can tell whether the image was cropped at the same rate. So, this thing where indicate whether it's a full field of view or a cropped field of view. The particles look the same, which means they are either full field of view or cropped at the same rate. That is my conclusion.

Again, here is -- the FOV, I'm talking about image field of view. You see? The image have a field of view. It doesn't matter the image had been cropped or not.

Q. Those two images that you utilized there, are different images taken from different reports, correct?

A. Yeah. Yes. One is 71095, 71940.

Q. They were taken from different particles. Regardless of what you think the particle is, they're not the same particle, correct?

A. They are. They're both -- the title of the report is the baby powder.

Q. The specific particle being viewed is

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not the same particle in both photographs?

A. They are different baby powder bottle.

Q. I want to ask you about -- I'm going to put this on the screen here. This is Exhibit 3 of your -- this is Exhibit 3. This is page 11 of your report. Okay? You have this paragraph at the bottom of page 11.

You state, "As shown in the table above, from 2020 to 2024, over a five-year span using various different sample preparation techniques as described in MAS's expert reports, the heavy liquid separation sample preparation procedure produces a series of extremely inconsistent light fractions ranging from 13.4 percent to 24.2 percent in talcum powder products, which further produced chrysotile concentrations ranging from .003 percent to .01 percent.

"For baby powder samples consisting of 99.9 percent talcum powder, which should be in the heavy fraction, how is it possible that the light fraction more than 1 percent?"

You see that?

A. I see that.

Q. Who in the world told you that baby

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powder was 99.9 percent talcum powder? Who told you that?

A. The report told me.

Q. You know that baby powder has never been 99.9 percent talc.

A. Well, if the chrysotile concentration reported here is point -- less than .01, and they did not identify any other phases component in the baby powder, now, what else could be?

Q. Your criticism is based on the idea that Johnson's Baby Powder was 99.9 percent talc?

A. No, I was based on the MAS report.

Q. Okay.

A. Because they did not indicate the other phases in this baby powder; therefore, you minus the chrysotile concentration, you end up 99.

Q. Have you ever prepared a heavy liquid separation sample?

A. I did.

Q. When?

A. When I was working for Hercules for certain project.

Q. Did you do this one time or was this a routine part of your job?

A. Actually, more than one time.

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Q. Two times, or is this something, like something you did thousands --

A. Oh, much more than that. In my 20-years career in Hercules, we did so many project. Some project involved the heavy liquid separation.

Q. Have you ever done heavy liquid separation for the purposes of evaluating minerals in talc?

A. No.

Q. So, your statement here is that "For baby powder samples consisting of 99.9 percent talcum powder, which should be in the heavy fraction, how is it possible for the light fraction more than 1 percent? It is beyond comprehension that these ridiculous two-digit light fraction results did not make MAS realize that something was grossly wrong with each and every sample preparation that it tried over the course of five years."

Do you see that?

A. I saw that.

Q. So, for this to really be ridiculous, you would have to conclude -- or you have to start from the position that the baby powder was, indeed, 99.9 percent talc, right?

MR. HYNES: Misstates testimony.

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A. No. I said this report did not report a third phase in the baby powder --
Q. Are you saying p-h-a -- I'm sorry. Are you saying phase, like p-h-a-s-e?
A. Yeah.
Q. Continue, please.
A. Component, a third component in the product, now which only identify the chrysotile and talc.
If the report said there is a third or fourth components in the sample, then the 99 conclusion was incorrect; however, it says the only other components in this sample is chrysotile, therefore, what else could be?
Q. Okay.
A. Also, they never said in the light fraction besides chrysotile, there's other things than talc.
Q. Okay. Have you ever asked Matt Sanchez about how much talc there is in baby powder?
A. No.
Q. Ever read any Johnson & Johnson documents to determine how much talc they have in baby powder?
A. No.

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Q. Are you aware of industry documents that indicate that for something to be a consumer talc product, it only has to have at least 90 percent talc in it? Are you aware of this?
A. No, I'm not.
Q. Okay. So because MAS didn't report the amount of nickel or carbonates or whatever else might be present, you took that to mean that it was chrysotile and talc and nothing else?
A. That's right.
Q. Okay. Let me ask you about -- let me get this off. Actually, no, I'm going to leave this up there. I'm going to take away the highlight.
I like your cars picture, by the way.
There is a section of your report, this is page 92 of Exhibit 3 which is page 72 of your PowerPoint.
A. I saw that.
Q. All right. You want to take a second to go there?
A. Yes. I'm on this page.
Q. So, I just have some questions about this formula. This formula is "n" meaning the sample size that is large enough to attain the specified maximum allowable error and confidence

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level is equal to -- and I could read this out, but it's not going to make any sense in the record.
But, regardless, anyone who's following along with Exhibit 3 at page 72 of the PowerPoint can find the same formula?
For "n," what is the sample size that you're using when you conduct this analysis? Is it the slide, is it the --
A. The total amount of the sample to be analyzed.
Q. So, total amount of material under the slide?
A. Not -- if they put all the amount of the sample on the slides, it is. What I am saying, if the .000017 gram sample they took out from the bottle, if they spread all sample onto slide, yes, they are analyzing that amount.
Q. Okay. Is this corrected for, like, the weight of the cover slip and everything else, or is this -- I mean, does that make sense you would do that?
Never mind, that's a dumb question. Don't answer my dumb questions.
Then -- is this reported in, then, a percentage by weight or does this end up being

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reported as total grams or...
A. Actually, if you look at the report, the report said they sampled that amount of the sample for this analysis.
Q. Have you ever seen a calculation like this performed on something relative to PLM microscopy of particles like we're talking about?
A. I can only said when I was working at Research Center of Hercules, when we received some project, that's the first thing we do: How much sample we should analyze to reach the 95 perfect confidence level. This is the basic procedure of the determine a component system. Okay.
Q. Did you perform this calculation every -- first of all, have you performed this calculation relative to your opinions in this case?
A. I performed this calculation using MAS standard.
Q. Okay.
A. Which showed in slide -- yes, I did, although I did not put on this PowerPoint because the number is too large.
What I am saying is, if you plug this .000017 into this equation and you require -- actually, I'm very -- what I'm saying, I allow them

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probably maximum allowed error, probably 5 percent, 10 percent. Anybody can do the calculation and turn out the confidence level is so small, it just should not be used.

Q. So what I -- I want to start with a couple of do you agrees with me, and then we're going to go on to the question I'm really asking you. Okay?

A. Okay.

Q. You agree with me that nowhere in your report do you actually show the variable values that you use in performing the calculation that you're talking about?

A. I did not document that.

Q. Thank you.

You can provide that, correct?

A. Correct.

Q. You report that your calculation ended up far below 50 percent?

A. Correct.

Q. That's at the bottom of page 73 of your slide slow.

Are you able to tell me what values you used for variables in this formula, meaning the value for "n," the value for "p," and so forth and

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so on, and if not, can you provide that data to us?

A. Of course I can.

Q. Are you able to recall it now, the values that you used for --

A. No, I cannot recall from my head.

Q. Okay. Clearly we're going to make a request for that data. As long as that can be provided to us before you testify again, I think we'll be okay. I'm not trying to make a big deal out of this.

In fact, let's go ahead and take five. I am maybe close to being done here.

(Recess: 10:54 a.m. to 11:04 a.m., Eastern Standard Time.)

BY MR. BRALY:

Q. Dr. Su, I had a question about the materials that you produced after you had authored your report from the Pittsburgh project. There is a folder in what you produced called "SEM Images-Thermo Apereo," A-p-e-r-e-o.

A. Yes.

Q. And in that there are a series of images, and I'm just going to do a couple of these. The first one that I'm going to show you is marked as Exhibit 42. This is one of the images --

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A. Yes.

Q. -- that you produced.

What is this?

A. This is a talc -- I will have to look at the --

MR. HYNES: Could you just read off the file name?

BY MR. BRALY:

Q. Yeah; the file name is "Wet-Sieved" -- is it "sieved" or "sieved"?

A. Sieve.

Q. "Wet-Sieved Talc SG210 1000 SE_ETD."

A. Yeah, that is SG210 spiked talc sample.

Q. What does "wet-sieved" mean? What did you do to the sample?

A. The wet sieve is using the powder. They put in the water and then sieve it, because the water make it easier for the particle to pass through the holes of the sieve. Okay? That is more efficient than dry sieve. Okay? The dry sieve use vibration device to shake the sieves so that the particle was falling through the holes, but the wet sieve is much more efficient to see the kind of fine powder samples.

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So they wet the sample, put a water solution, and sieve it. Then this portion was retained by the 400 mesh sieve. They collect that from a service, then try to take SEM picture.

Q. So, this other image, which will be Exhibit 43. The file name on this is "Wet-Sieved Talc SG 210_6500_SE_ETD."

A. Let me explain the file name.

Q. No. Well, sure, go ahead. Tell us what the file name.

A. 6500 magnification. Okay.

Q. All right.

A. "SE" is secondary electron image. Okay?

Q. So, we can apply that structure to all of the file names in that folder?

A. That's right.

Q. Okay. Great. Thank you. That actually helps a lot.

So what we're looking at here is SG210 with what, little bits of talc stuck in it?

A. I think so.

Q. Is this part of what -- I'm sorry. Is this part of what you used to determine the part of your report discussing the role of fiber lengths

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and particle lengths?
A. Correct.
Q. Have you prepared any kind of a report or summation discussing your opinions relative to the data you produced as a result of the Pittsburgh meeting in June of this year?
A. You mean prepare what report?
Q. That's what I'm asking you: Have you prepared a report or a summation of your opinions relative to the data you produced in June specific to the Pittsburgh project?
A. Nobody ask me. Okay.
Q. So you have not?
A. No.
MR. BRALY: Chris, are you good to go here?
MR. PLACITELLA: You're ready for me?
MR. BRALY: I believe so.
MR. PLACITELLA: Okay. Well, why don't we take a five-minute break then, and I'll get my stuff together.
MR. BRALY: Okay. The one document that you asked me to print, I'm going to go ahead, and that will be the next exhibit in line, which is Exhibit 44. Okay.

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MR. PLACITELLA: Okay.
MR. BRALY: All right. I will pass the witness at this time and let Mr. Placitella ask some questions.
(Discussion held off the record.)
CROSS-EXAMINATION BY MR. PLACITELLA:
Q. I wish I could be there with you this morning, Dr. Su. How are you today?
A. I'm fine. Thank you.
Q. Thanks for taking the time here.
In preparing your report related to Dr. Longo, were you able to use the photos he supplied and make -- and provide opinions concerning those photos?
A. Yes.
Q. Okay. And were you able to take the data that he supplied and provide opinions related to that data?
A. Correct.
Q. And despite whatever shortcomings you indicated earlier on, you were able to take the opinions and the data supplied and provide opinions in this case, correct?
A. Correct.
Q. All right. And your opinions differ

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from Dr. Longo, correct?
A. Correct.
Q. Okay. And you were able to provide your opinions despite any issues you had with the lighting, correct?
A. Yes. I mention the lighting is a factor affecting the dispersion staining color.
Q. Okay. But you were still -- despite your issues with the lighting, you were still able to provide an opinion based upon the method and data that Dr. Longo used, correct?
A. Correct. All my image or data is from MAS reports.
Q. Okay. And despite the testimony you gave about brightness concerning the photo, the data that was generated by Dr. Longo's lab enabled you to provide an independent opinion in this case, correct?
A. Correct.
Q. Okay. Now, in this case, the first day I counted you mentioned "Becke line" about 79 times.
And after you went to Middlesex County and witnessed Dr. Longo's testimony, is that when you went to Pittsburgh?

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A. Yeah, I went Pittsburgh after that.
Q. Okay. And you did -- and you said that one of the definitive tests to perform was the Becke line analysis, correct?
A. Can you say again?
Q. One of the definitive tests that you use was the Becke line test, correct?
A. Correct.
Q. How long did it take you to do that --
A. It's very quick. You just --
Q. -- when you were in Pittsburgh?
A. Yes. Okay. It's very quick. You just switch to a non-central stop dispersion mode.
Q. Okay. When you were with Dr. Sanchez in Pittsburgh, how long were you there?
A. We were there for two and a half days.
Q. Okay. And the actual -- two and a half days, and the actual testing that you did, how long did that take?
A. Oh, I should correct. We were there -- we arrived the day before. I mean, we worked for two and a half days.
Q. So you were there three and a half

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days together?
A. Yeah. I arrived there the day before, I leave the third day. That's why it's half day. I leave in the afternoon.
Q. And in front of the microscope, how much time did you spend when you were in Pittsburgh?
A. I think the first day probably nine or ten hour. The second day is pretty similar to that. The third day, the half day is, I think, in the morning, and one hour in the afternoon. Or one hour in the --
Q. So --
A. Half afternoon, because I left at 3 p.m. to the airport.
Q. Okay. So you spent about 15 to 20 hours under the microscope?
A. I think I spent probably 26 or 27 hours in doing the analysis.
Q. Okay. So you spent 26 or 27 hours doing the analysis. And of the 26 or 27 hours, was it -- how much time of that 26 or 27 hours did you use to do the Becke line analysis?
A. I did not count the time. Every time I look at dispersion staining color, I turn the objective lens to switch that to Becke line mode.

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That is the --
Q. What's your best estimate of the amount of time you spent in the Becke line mode of the 27 hours?
A. Probably equal to the amount time observing the central stop dispersion staining color.
Q. Okay. And how much did you charge for that work, those three days?
A. Just the hours I've been working.
Q. Right.
Do you have any idea what you billed them for?
A. Like, I don't remember exact number, but it was calculate by the travel time plus the actual time working in the lab.
Q. And did you record everything you did?
A. Yes.
Q. And after you did that, you never supplemented your MDL report, correct?
A. No.
Q. Now, whose idea was it to videotape what you were doing?
A. My idea.

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Q. Okay. And am I correct that none of the work that you did in Pittsburgh involved heavy liquid separation?
A. No.
Q. So I'm correct; none of it did, correct?
A. Correct.
Q. Okay. You also at some point monitored Dr. Hess's -- Mr. Hess's deposition, correct?
A. Correct.
Q. All right. Did you help counsel prepare for that deposition?
A. No.
Q. Did you read the transcript after the deposition?
A. I read part of them so far; not the whole transcripts.
Q. What was your role -- or what did you understand your role to be to when monitoring the deposition?
MR. HYNES: Vague.
A. I want to know how he analyzes samples, how he did, because he is the -- he is the one who perform the analysis. I want to know the

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detail of his analytical procedure and technique.
Q. Okay. But you were able to prepare your 100-page MDL report without knowing that, correct?
A. Correct.
Q. Did Mr. Hess testify to anything that you disagreed with?
A. Yes.
Q. And what was that?
A. If I can recall from the report I read, the first issue is he said for negative elongation mineral, the gamma is less than alpha, which is totally incorrect.
Also, the second issue so far after I read the transcript is, he said he did not calibrate the dispersion staining color by himself; somebody else did that. That is also wrong. Because if you are the analyst, you will have to calibrate your eyes to the dispersion staining color displayed in the equipment you used to perform analysis.
So far, those are two issues I found which is wrong.
Q. Anything else?
A. Not yet. I have not read the whole transcript yet.

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Q. But you were there. What do you recall that you disagreed with? What else?
A. So far I cannot recall from my head. I would trust the transcript; therefore, I have to wrest through the whole transcript to see is any other issue I disagree.
Q. So, as you sit here today, the only two things you can recall are what you just testified about, correct?
MR. HYNES: Asked and answered.
A. Could you say again? Could you repeat the question?
Q. Yes.
As you sit here today, the only two issues you're able to recall are those that you just spoke to me about, correct?
A. Correct.
MR. HYNES: Same objection.
BY MR. PLACITELLA:
Q. Okay. You are -- do you recall that there was some disagreement about -- well, strike that. I won't go there.
Are you familiar with a testing method called X-ray diffraction?
A. Yes. But I have not reviewed any

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X-ray diffraction report from MAS.
Q. That's not my question. My question is: Are you familiar with X-ray diffraction?
A. Yes, I do.
Q. All right.
(Technical difficulty.)
BY MR. PLACITELLA:
Q. Have you ever used X-ray diffraction for any type of asbestos analysis?
A. Not asbestos.
Q. Okay. Can you use X-ray diffraction to find chrysotile in talc?
A. No, I don't think there are procedure technique to find chrysotile asbestos, I emphasize, not the general chrysotile, but --
Q. Right.
A. -- I know we meant chrysotile asbestos.
No, there's no technique which can analyze chrysotile asbestos by powder X-ray diffraction. It's not any X-ray diffraction; it's called powder X-ray diffraction.
Q. Right.
Can you use powder X-ray diffraction as a screening technique to determine if talc has

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asbestos in it?
MR. HYNES: Vague.
A. No, because the powder X-ray diffraction could not determine the aspect ratio.
Q. Okay.
A. So it cannot determine any asbestiform minerals.
Q. So, in your expert opinion, X-ray diffraction cannot be used to detect any asbestiform minerals; true?
A. No.
Q. And does that include amphiboles as well?
A. As well.
Q. Okay. And that's based upon your 40 years of experience?
A. No, it's not based on my experience; it's based on the principle of the technique.
Q. Okay.
A. The technique can only determine the mineral phase by the crystal structure, but it cannot determine the morpholog. As you know, the morpholog is one of the important criteria to define asbestos mineral.
Q. Okay. So, should X-ray diffraction

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ever be used as a screening technique as a first step in determining whether a product contains asbestos, in your opinion?
MR. HYNES: Vague; overbroad.
A. I have not research on this project.
Q. Well, in your opinion and experience, is X-ray diffraction a valid method as a first step for screening for asbestos in material?
MR. HYNES: Vague; overbroad; asked and answered.
A. Not asbestos, but as a screening tool for mineral identification. There's a difference between the mineral identification and asbestos identification.
Q. Okay.
A. When you say "asbestos," it has to be confirm in the morpholog. Since X-ray diffraction could not determine the morpholog, so it's accurately speaking it's not screening tool for asbestos.
Q. Okay. Is it a valid screening tool for finding serpentine minerals?
A. That's right. It's a screening tool, I repeat, for mineral identification, not involving morpholog.

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Q. And do you have any idea of what the -- how long -- well, strike that.
I'm going to talk a little bit now about -- just a couple of questions about PLM.
If you're using -- have you ever used PLM to determine whether there was asbestiform and amphiboles in a product?
A. No.
Q. Why not?
A. Because so far I was asked to review the PLM analysis of chrysotile.
Q. Okay. Do you need to do a Becke line analysis to confirm whether something is an asbestiform amphibole?
MR. HYNES: Vague; overbroad.
A. Could you repeat question, please?
Q. Sure.
You talked about the need with Mr. Braly to perform a Becke line analysis to determine whether what you're saying is chrysotile, correct?
A. Correct.
Q. All right. Do you have to do the same thing when you're trying to determine whether an amphibole is asbestiform? Do you still need a

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Becke line analysis?
A. I'm sure I would need that; however, so far I have not been asked to do that.
Q. Well, I understand you haven't been asked to do it. I'm asking you, based on your expertise as a PLM microscopist, whether in order to determine a product, an amphibole product is asbestiform, you must do a Becke line analysis?
A. Yes.
MR. PLACITELLA: Ben, do you have the document that I gave you?
MR. BRALY: Yes.
MR. PLACITELLA: Could you mark that and give it to the witness?
MR. BRALY: Yeah, it's Exhibit 44.
MR. PLACITELLA: Okay. I want to see if I can share my screen at the same time.
Can you see my screen?
MR. BRALY: Very small.
MR. PLACITELLA: I'll make it bigger.
THE WITNESS: Yeah, I can look at the hard copy. Which page do you want to --
MR. HYNES: Seven.
BY MR. PLACITELLA:
Q. Can you see my screen now, or page 7?

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A. Okay. Yeah, I'm at page 7.
Q. Just take a second and look at that.
For the record, I'm showing him Part 2 of the CTFA J4-1 Asbestiform Mineral Analysis protocol.
Let me know when you're done looking at it, Doctor.
You with me?
A. Yes, I finished reading.
Q. Okay. Sorry.
Okay. So, under -- see under the section where it says "Optical Microscopy and Dispersion Staining"?
A. Yes.
Q. All right. Would you -- in your opinion, is that procedure as outlined in this specification sufficient to identify an asbestos-containing amphibole without anything else?
A. I don't think this correct procedure, or a complete procedure.
Q. And why is that?
A. Because nobody identify asbestos by central stop dispersion staining color; you identify any asbestos component by refractive index. So here it says only about the dispersion staining color in

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the oil, 1.605. It did not mention how you get the dispersion staining color. Because the dispersion staining color is affected by the intensity of illumination, by the distorted dispersion staining color, also by the calibration of the system, affected also by the color temperature of the light source.
So, the color is affected by so many factors, so nobody ever defined in any literature or any test method to define a asbestos component by color.
Q. So --
A. However, the only parameter which can identify is the refract index. The refract index is absolute, is intrinsic property of the asbestos mineral. Whether you measure it in California, measure that in New Jersey, the refract index is the same. However, the color would depend which polarized light microscope you use, what kind intensity of illumination you use, or whether what is the color temperature, what the light source, whether it's a constant or AED, whether you use a daylight filter. They all affect the color displayed by the particle.
So, therefore, you can really not,

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just by saying you can identify simply by color.
Q. Okay. So, up at the top it gives you the list of the apparatus that's part of this spec, right? It says, "Bertrand lens, high-intensity light source."
You see that?
A. Yes, I saw that.
Q. So using that apparatus, and this as a specification, could you ever determine definitively whether a mineral that you're seeing is asbestiform or not?
MR. HYNES: Vague; overbroad.
A. Anyway, let me emphasize the only way you can determine the asbestos, whether it's chrysotile or amphibole, is to measure its refract index on the polarized light microscopy. This procedure does not tell you how to do that. Also, it did not mention the color temperature of your system. It mention the source, high-intensity light source. You can use a different level of intensity.
Now, you can use the different color temperature. You can use the daylight filter or not. Each variation will affect the central stop dispersion staining color displayed and observed by the operator, by the analyst.

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Q. So --
A. Also, a very important procedure here is missing. As I said, you can only identify whether it is asbestos or not by measuring the refract index. This procedure did not tell you about that. Even you observe the dispersion staining color, how do you get the refract index, which is the most important part of the procedure? However, this procedure did not tell you.
Q. All right. So if you gave this specification to ten different microscopists, is there any way to guarantee consistent results just following this specification?
MR. HYNES: Calls for speculation.
A. As I said, not by following this specification. This specification did not tell you the color temperature, did not tell you the light source, did not tell you intensity, many factors which affect the dispersion staining color. And also, it did not tell you, you will have to calibrate the dispersion staining color, again, the specific instrument, the specific setting, and also the specific eyes' perception to the color.
Q. So --
A. There are so many factors are missing

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in this specification. So this specification could not produce the correct refract index. I have to emphasize, only refract index can identify whether it is asbestos or not. But this procedure completely missed that procedure, that step.
Q. Could this specification ever identify chrysotile using a PLM, in your opinion?
A. If you know how to correctly perform the dispersion staining technique, if you know how to correctly perform the "methododge" and also you know how to convert the color into the refract index, now you can. If you cannot produce the correct assessment of the central stop dispersion staining color, then you couldn't.
Q. Okay. So, how would you guarantee -- so if you had to rewrite the specification, what would you include?
A. Well, if I am commissioned to do that, I will write a very detail step-by-step procedure for analysis. Okay? Then everybody can follow.
Q. Why do you need a detailed step-by-step analysis?
A. Because, as I said, there are so many factors affecting the central stop dispersion color

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displayed and observed by the analyst. And also, a most important step of procedure is, if you can correctly get the dispersion staining color, then you will have to convert that color into the numerical value of the mineral, then you can identify. Without that step, nobody can.
So, this procedure is so incomplete and so vague, but I'm sure I can develop a complete procedure to accomplish this task by correctly measure the refract index of any mineral, opaque mineral by polarized light microscopy.
Q. So, I do apologize because I interrupted you.
You said you would give a step-by-step detailed procedure. Can you just lay that out for us? How would you rewrite the specification if you really wanted to find out whether a product had asbestos in it or not?
A. Yeah, if I'm commissioned to do that.
Q. Well, you're getting paid by the hour now, so do your best.
A. Nobody ask me. Okay?
Q. I'm asking.
A. Well, okay. I will consider, however, and I can bill you for the time?

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Q. We're being billed in the deposition, Doctor. I just want to know if you have to rewrite the specification to make sure it was capable of finding asbestos in talc, what would you -- what would you put in? Give me your outline, at least.
MR. HYNES: Objection to form; asked and answered.
A. I would cover every aspect of the correctly measure the central stop dispersion staining color. First, the method or procedure will cover every aspect about the central stop dispersion technique; secondly, my cover -- my procedure will cover how do you derive the object's refract index by central stop dispersion staining technique.
So there are two major part: First, there are many details about obtaining the correct central stop dispersion staining color; the second major part will be how do you go from the color to the refract index.
Q. Okay.
A. If I will write the procedure, I will cover every aspect.
Q. So if you were giving advice to Johnson & Johnson for what they should do to screen talc for asbestos, would you ever advise them to use

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this method that's on this document?
A. It have not happened, okay, so I cannot say anything about that. But I can assure you I'm fully capable and qualified to give -- to document a very comprehensive and accurate procedure to perform the analysis.
Q. But here's my question, I know you haven't been commissioned to do it. Would you ever recommend to Johnson & Johnson that they use this procedure to screen for asbestos in talc?
MR. HYNES: Vague; calls for speculation.
A. I have not been asked to; therefore, I don't have to express my opinion. However, if I am asked to, I can do that.
Q. Respectfully, Doctor, I'm just asking a simple question: Would you ever recommend to Johnson & Johnson to use this procedure to screen talc for asbestos? That's my question.
MR. HYNES: Same objection.
A. Why I should recommend to them?
Q. I'm asking you as somebody with experience who's testified now for a couple of days and has 40 years of history using a polarized light microscope, would you ever recommend to

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Johnson & Johnson that they use this procedure outlined in this specification to test for asbestos in talc? It's a simple question: Yes or no?
MR. HYNES: Same objection.
A. It's not yes-and-no question. It is a question: Why should I do that?
Q. Because I'm asking you a --
A. Then if I must do that, of course I can.
Q. Okay. So, I'm asking you in a deposition so we know what your opinions are on PLM whether you would ever recommend to Johnson & Johnson that they use this specification to screen for asbestos in talc. It's a very simple question.
MR. HYNES: Same objection.
A. No, it's not a simple question. You mean what I would recommend, why I will have to recommend? That's the first question. If I have to, then you can ask me whether I would do that or not.
Q. So, are you refusing to answer the question, Doctor?
A. I refuse to answer this question not because I am not capable of outlining a detailed

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procedure, it's I need to know what I should recommend or not. I need to know the reason.
Q. Let me ask you the question this way.
A. Okay.
Q. Are you capable of providing an opinion as to whether this specification -- (technical difficulty)
A. Of course I'm capable.
(Discussion held off the record.)
MR. PLACITELLA: We're not sharing a screen anymore, correct?
MR. HYNES: Correct.
BY MR. PLACITELLA:
Q. Are you capable of providing an opinion as to whether Johnson & Johnson should ever use this specification to screen for asbestos in talc? Are you capable of giving that opinion?
A. I am capable.
Q. Okay. And what is that opinion?
A. Is that about whether I'm capable of producing a procedure to determine the refract index of mineral including asbestos? I want a clarification on that.
Q. Okay. Let me ask the question a different way.

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A. Okay.
Q. If you were a scientist working at Johnson & Johnson and assigning somebody the task of determining whether there's asbestos in talc, would you ever hand them this specification with no other instructions and say, "Follow this specification"?
MR. HYNES: Objection to form; calls for speculation.
A. I still don't understand your question because my job here is to assess the analytical report by MAS. They found asbestos in the chrysotile to be exactly in the baby powder product. My job is to assess whether their report is correct or not.
Q. Well, let me ask you the question this way: You indicated earlier when I was questioning you that Dr. Longo's lab was able to generate data and photographs that you could rely upon in forming your own opinions, correct?
A. Correct.
Q. If Dr. Longo's lab followed this specification, would they be capable of generating reports and data that you could rely upon?
MR. HYNES: Incomplete hypothetical; calls for speculation.

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A. Which specification? Could you please clarify?
Q. The specification in front of you for PLM for Amphiboles - Part 2.
MR. HYNES: Same objections.
A. If they perform the technique correctly, that is the prerequisite. If they are incapable performing the technique correctly, they can't; however, if they truly understand the optical crystallography, polarized light microscopy and optical mineralog, of course they can. However, as I repeat, this procedure is so complete, it did not tell the analyst how do you determine the refract index. So, therefore, this specification is very incomplete.
Q. Would you agree with me that this specification indicates it's for amphiboles only?
A. Not for any mineral.
Q. It says, for amphiboles; does it not?
A. No.
Q. It doesn't? Are we looking at the same thing?
A. It doesn't.
Q. What's the title say on Phase 2 at the top of the page?

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A. Well, the title is "Specification" -- let me see. Also on the top of the cover, CTFA, Cosmetic --
Q. I'm just talking about the top of the page we're looking at.
A. Yes, "CTFA Specification."
Q. Right. Okay. And does it say "asbestiform amphibole minerals"? Top of page 7.
A. Talc.
Page 7, yeah, amphibole.
Q. Amphibole.
Would you agree with me as written, this was never intended to find chrysotile in talc, if it existed?
A. No. As I said, this specification is so complete, and also, it lacks so many details.
Q. When you say "complete," you mean incomplete, correct?
A. Incomplete, yeah.
Q. Incomplete.
A. Not complete.
Q. Not complete.
A. Yeah. Incomplete.
Q. So we're on the same page, and I'll stop.

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As written, this specification is so incomplete that there's no way it could be used on its face to determine whether there's asbestos in talc; true?
A. No.
Q. Would you agree with the following statement: "It's imperative that both dispersion staining color and fibrous morphology criteria be satisfied, as well as the Becke line determination of refractive index, before identifying a particle as asbestiform amphibole"?
A. Not according to this specification.
Q. And so this specification fails in that regard, correct?
A. That's right.
Q. Okay. Let me just look here. We might have to take five minutes so I can talk to Ben. He'll tell me what else I forgot. So why don't we just take five minutes. Okay?
A. Okay.
(Recess: 11:59 a.m. to 12:06 p.m., Eastern Standard Time.)
MR. PLACITELLA: So, I don't have any other questions at this time, and I'm hopeful you can get out of New Brunswick and beat the traffic

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before it gets bad. So, unless somebody else is going to ask any other questions, I'm done.
MR. HYNES: Are there any other questions from people on the line?
Hearing none, I will have a couple questions, Dr. Su. Thanks, again, for sitting for this deposition over the last two days. Appreciate it.
THE WITNESS: Thanks.
CROSS-EXAMINATION BY MR. HYNES:
Q. The first thing I wanted to ask you was, today you mentioned this concept of birefringence. You described it as the absolute difference between the alpha and gamma refractive index values. Is that right?
A. Correct.
Q. So if we looked at some of the sources that you cited in your report, such as R-93, Bloss, ISO 22262-1, we would see that birefringence is defined as this absolute difference between alpha and gamma, correct?
A. Correct.
Q. Okay. And this idea that you may see a range of refractive index values in chrysotile from the same source, that's something that you

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don't agree with. Is that right?
A. No.
Q. You will see one true refractive index in alpha and one true refractive index in gamma. Is that right?
A. Correct.
Q. Okay.
MR. PLACITELLA: Let me just put my objection on the record. I'm not going to keep doing it, but these are leading questions of an expert witness in a deposition, and I'm going to object to any of those questions. And if you give me a standing objection to your leading questions, then I won't interrupt anymore.
MR. HYNES: Standing objection.
BY MR. HYNES:
Q. Dr. Su, you also described in, I think, day one of your deposition that you would refer to R-93 for refractive index values in chrysotile. Is that right?
A. R-93, EPA method?
Q. Yeah. Table 22, I think.
A. Yeah, that is the table describing the refract index of the asbestos minerals.
Q. Okay. And then do you also cite

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ISO 22262-1 in your report?
A. Yes.
Q. Okay. And does ISO 22262-1 include known ranges for NIST standard chrysotile refractive index values?
A. Say again, what question is?
Q. Does ISO 22262-1 also include known ranges for refractive index values for NIST standard chrysotile?
A. Actually, I don't know because I never read that section, if there is a section of that.
Q. Okay.
A. Because I know what refract index 1866 is. Okay?
Q. Okay. So if it's reported in there, it's reported in there. That's fine.
Then you were asked a series of questions about this concept of Becke line analysis.
There are methods for determining refractive index values of a mineral using Becke line analysis independent of any central stop dispersion staining analysis. Is that right?
A. Correct.
Q. Okay. The central stop dispersion

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staining analysis uses Becke line as a complementary way to determine what part of a particle that you're looking at under central stop dispersion staining color, you should use to assign the correct refractive index value. Is that right?
A. Correct.
Q. Okay. And so, this concept of Becke line analysis, it's not that it's a independent method, it's part of how a trained analyst who knows how to perform central stop dispersion staining will perform their central stop dispersion staining analysis. Is that right?
A. No.
Q. Tell me more, then.
A. Yeah, the Becke line is not a dependent method; it is the independent method. Matter of fact, you can determine the opaque minerals refract index simply by Becke line, but you cannot do this for central stop dispersion staining color technique without Becke line method to differentiate the distorted dispersion staining color from the normal correct dispersion staining color.
Q. Okay. So, is it true that a trained analyst who understands the principle of central

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stop dispersion staining will, in order to determine what are true dispersion staining colors versus distorted staining colors, they will refer to the Becke line to make that call?
A. Yes. Yes.
Q. Okay.
A. A very important part of the procedure is to recognize which part of the dispersion staining color is the normal dispersion staining color and which part of the dispersion staining color displayed is distorted dispersion staining color. Now, to differentiate between these two, you have to use the Becke line. So far that's my experience.
Q. Okay. You were asked some hypotheticals about bundle thickness and its impact on refractive index values.
In central stop dispersion staining analysis, is it true that bundle thickness will not change the refractive index of a mineral being analyzed?
A. No, because the refract index is an intrinsic physical property of any crystal, any minerals. It was determined by the elemental composition, the chemical composition, and the

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crystal structure, the way how those atoms connect to each other.
Now, these two property will not change with size or thickness of a material, a mineral. So, even the size of the change, the refract index is not. Again, I have to, if refer to asbestos to chrysotile. And we have evidence, as I said, the standard reference material 1866 series, whether 1866, 1866a or 1866b, they are measured as single fibrils. You cannot go any thinner than that. Therefore, the refract index value, the gamma 1.556, alpha 1.549 is for the chrysotile. It did not change with the fiber size or bundle size.
Q. Shifting gears: Counsel for plaintiff marked Exhibit 41, a series of count sheets for TEM analysis of chrysotile SG210.
Do you recall reviewing that for the first time during today's deposition?
A. Yes.
Q. Okay. The count sheets and photomicrographs that you were provided, do they provide any information for you about the sample preparation process for the materials being analyzed here?
A. Sample preparation?

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Q. Correct.
A. Standard TEM grid preparation.
Q. But do you know what was done, whether or not there was liquid density separation technique used, sonication performed, wet-sieving, anything of that nature before these materials were analyzed by TEM? Is that information included in what you were shown today?
A. No.
Q. And sample preparation procedures may impact the size distribution of particles that are being analyzed subsequently by TEM, right?
A. Correct.
MR. BRALY: Object to this. He's been offered as an expert in PLM. But go ahead. That's fine.
BY MR. HYNES:
Q. You answered that's right, right?
A. Yes.
Q. And you were asked some questions about a NVLAP inspection in 2016.
Do you recall that questioning?
A. Yes, I did.
Q. That's when you were an assessor and you went to MAS's laboratory to review the

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conditions at the time in, I believe it was September of 2016, correct?
A. Correct.
Q. That predates any of the Johnson & Johnson reports that you've reviewed in this case, correct?
A. No. No. I was not aware of -- again, they have not give me any of those material for me to review. And the assessment, as matter of fact, only concern two technique: One is the bulk asbestos analysis by EPA; the second is the airborne asbestos analysis by EPA. So that's only two technique I need to assess, not actual sample they apply that. But normally, we want focus on AHERA. I will ask them AHERA analysis, but not any other client request.
Q. So the types of analyses that you reviewed that Dr. Longo produced in which he identified chrysotile by PLM in Johnson & Johnson Baby Powder containers, those sorts of procedures were not something you evaluated during that visit in 2016?
A. No, not at all.
Q. And then correct me if I'm wrong, but would a laboratory that receives a NVLAP audit

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receive the audit reports that are prepared by the assessor, and then the reviewer who assesses the report of the assessor that actually made the site visit, would they get those materials?

A. Oh, yes, they do. Actually, before the assessor leave the lab after the completing the assessment, you will have to review the whole report and get their signature. You have to give them a complete copy, which have the three form, the general criteria form, the polarized -- the bulk asbestos form, the PLM form, and the third is the TEM form.

Q. And have you been a reviewer of an assessor's report at MAS since this 2016 timeframe?

A. Yes, I did.

Q. Did you have criticisms of MAS after this 2016 NVLAP report was issued?

A. Yes. And I recognized there's a page of the -- my assessment in 2016, and there is a page of Dr. Bo Li's assessment in 2021, let me see, 2021 or 2022. Yeah, I saw a sheet that remember me, yes, I reviewed Dr. Bo Li's assessment report. That is part of the NVLAP procedure. I did not ask to review -- assign the review work to me.

Q. And you got criticisms of MAS's PLM

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procedures in that 2021 --

A. Correct. Because one of the nonconformity reported documented in Dr. Bo Li's report is they confuse the alpha and gamma for chrysotile in their count sheets. And when MAS respond to this report, to this nonconformity, they said it did not affect the past analysis because NVLAP procedure required where you identify a nonconformity, one of the thing the lab will have to review what kind impact are your past work, if you made some mistake; now, what kind of impact on the past work until this time the mistake was identified by the assessor.

So, I remember the response from MAS was it did not affect the past analysis, which I don't -- I did not agree, because that is so basic, such a major mistake. Alpha is smaller than gamma. How could you, in your bench sheet, you said the alpha is greater than gamma. Of course this mistake affect every report you issued before Dr. Bo Li's assessment. Okay?

So, the lab respond and says we were correct that; however, we don't think it would affect the past results. Therefore, in my comments, I said there's such a fundamental mistake, sure it

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will affect, because all your past reports, they were wrong. I remember I made that comment in my review.

Q. And that was -- those comments and that review, that all happened before you had ever seen any of Dr. Longo's analyses of chrysotile in cosmetic talcs?

A. No, it was in 2021, I wasn't aware. I know nothing about the talc sample.

Q. Okay. And do you know whether or not Dr. Longo's laboratory is currently a NVLAP accredited laboratory for PLM work?

A. Not right now, but they used to. They used to, I think.

Q. All right. You were asked a number of questions about the CTFA J4-1 methodology.

Do you recall those questions by Mr. Placitella?

A. Yes.

Q. Were you familiar with the specification before you saw it during the course of today's questioning, or is this the first time that you've seen it?

A. That's the first time I saw that.

Q. Okay. So you don't know when this

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was promulgated?

A. What?

Q. Do you know what year this was promulgated?

A. No. Must be a number of years ago. I think I had some vague impression reading some paper, they said there was a method, but I never seen that method document myself.

Q. Okay. And you don't know any of the context in which this method was developed. Is that right?

A. No, not at all.

Q. Okay. And one of the things that you mentioned here was that the method itself doesn't provide, you know, the level of specificity that you would require for soup to nuts polarized light microscopy analysis of asbestiform minerals in talc. Is that right?

A. That's right.

Q. Okay. You would go to other potential references for further information about how to perform the specific central stop dispersion staining analysis beyond what's presented on this page 7 of what you were shown. Is that right?

A. That's right.

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MR. PLACITELLA: Objection; leading. Objection; leading.
MR. HYNES: Go ahead.
A. However, the major -- major flaw of this specification is, they did not have the key procedure to determine the numerical refract index of the amphibole. Without that data, there's no way you can identify whether the target object is amphibole or not.
Q. Say, in 1976 or 1977, what references would you go to for that information that you just described?
A. I don't know. Maybe McCrone. Okay?
Q. Okay.
A. Dr. McCrone had developed the graphic solution from dispersion staining color to the numerical refractive index. I believe at that time Dr. McCrone had that procedure. You can use his graphic solution to get the numerical value of the asbestos mineral or any mineral from its central stop dispersion staining color.
Q. And one of the things that's noted on the following page is that dispersion staining device that's commercially available would be from Walter McCrone. Is that right?

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A. That means the dispersion staining objective.
Q. Right.
Okay. And then you brought a couple of documents with you to today's deposition. I don't know what they are, so, do you want to just tell us what they are and maybe we'll mark them as exhibits.
A. Okay.
MR. PLACITELLA: Are these documents that have been disclosed before?
MR. HYNES: He brought them with him to today's deposition, so I do not know.
MR. PLACITELLA: Well, that's not fair and I object to any questions about them. That's not fair. You knew they were coming. If you had that document he was bringing, he should have disclosed them. I mean, this deposition by ambush that you've been conducting now for two days needs to stop.
MR. HYNES: I apologize, Mr. Placitella, however --
MR. PLACITELLA: There's no apology. This was deliberate. This was deliberate. He had the documents. You could have turned them over and

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you didn't.
MR. HYNES: Well --
MR. PLACITELLA: And I will bring it to the attention of the Court.
MR. HYNES: Why don't we walk through what he brought with him and then you can decide whether or not you want to continue to object.
BY MR. HYNES:
Q. Go ahead, Dr. Su. What did you bring?
A. Okay. The first one is my -- my paper in 2022, "The Dispersion Staining Technique and Its Application to Measuring Refractive Indices of Non-Opaque Materials With Emphasis on Asbestos Analysis," which was published in the journal, "The Microscope." That's the first thing I brought.
Q. That was Exhibit 13 to day one?
A. Yeah. That was on the first day deposition.
The second thing I brought was the transcript --
Q. Exhibit 32.
A. Exhibit 32 of the last deposition.
The third document I brought, yeah, was two table, which one is the chrysotile in

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Cargille oil 1.550; the second is the chrysotile in Cargille 1.560, which were used to -- by MAS.
MR. BRALY: Do you mind if I just take a look at them?
A. (Handing.)
Q. So those are your --
A. Yeah --
Q. -- tables?
A. That's my table plus the ISO dispersion staining color chart provide by -- from ISO document.
MR. HYNES: Okay. So, and that's -- just for the record, so I guess what we have is, it looks like -- so the first page in this manila folder is chrysotile in Cargille 1.550E, and so it looks like Dr. Su took the alpha and gamma 21 degrees Celsius from his 2022 publication along with the wavelength column of that table, and then in the middle of those he put the ISO color bar.
BY MR. HYNES:
Q. So, everything is together on one page. For ease, you're matching up. Is that right?
A. Yes.
Q. Okay. And then the next page of this is the same thing, with the 1.560 from that. I

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guess it's the excerpts of the table from the same publication. Is that right?
A. Correct.
Q. Okay. And then the next is just the full table for 1.550; and then the next is the full table for 1.560, right?
A. Yeah.
Q. Okay. And then did you bring anything else with you?
A. Yeah. The third document I brought is my MDL report on May 21st of 2024.
Q. Okay.
A. I think that's all.
Q. Right.
I guess -- so, why did you bring these charts, Dr. Su?
A. Yeah, because I was evaluate the Exhibit 32, because I was asked in last session about the bentonite report by MAS. At that time I answered they are Calidria chrysotile. Now I realize after I exam the Exhibit 32 provide by the plaintiff, I realize my answer was wrong. They were not Calidria chrysotile.
Q. Okay.
A. And based on the refract index value,

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documented in MAS micrograph, the photo. Because the value indicate the alpha and the gamma value is totally different from the Calidria chrysotile. And the birefringence, the number one sample is .03, or 13. The rest is 6. The range value is .017 to .019, which is completely -- which is out of the range of any chrysotile, let alone the Calidria. The Calidria birefringence is .005.
Every sample in this exhibits is way above that. They range from 1.013 to .019, whereas the Calidria chrysotile is .005; therefore, none of this minerals, they are Calidria chrysotile.
Q. Looks like there's one more thing that you, I guess, brought with you. It's this one page --
A. Okay. Yeah, I summarized that.
Q. I guess we have a one-page sheet.
A. Yeah. Just from Exhibit 32.
Q. Okay. I guess, for the record, we should mark 45, we'll mark those four tables you made; and then 46, we'll mark the one-page sheet. And then it looks like you put Post-Its on Exhibit 32, so we'll mark that all as one.
MR. PLACITELLA: Just for clarification, the tables were created between last

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deposition and this deposition?
MR. BRALY: No, Chris. It's just a central stop dispersion staining table.
MR. PLACITELLA: I can't see it. That's why I'm asking.
MR. HYNES: Yeah, these are just -- yeah, basically, he took his table from that publication he carried in with him.
MR. PLACITELLA: Okay. Got it.
MR. HYNES: And he put an ISO color bar.
THE WITNESS: Can you show this on the screen?
MR. BRALY: No, we're fine.
MR. HYNES: It will be marked as an exhibit, and we'll mark this handwritten set of stuff as 46.
THE WITNESS: Okay.
MR. HYNES: And that's it.
Questioning?
MR. BRALY: Yeah, briefly.
REDIRECT-EXAMINATION BY MR. BRALY:
Q. Dr. Su, you're almost through here. Congratulations. You survived your first deposition.

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Using the Becke line analysis to complement dispersion staining is something that you have never published until 2023, correct?
A. Yes.
Q. That is correct?
A. That's correct.
Q. Great.
Nowhere in your report, which is Exhibit 3 to this transcript -- nowhere in your report did you criticize how Dr. Longo calculated his birefringence, correct?
A. I think I did.
Q. No, you didn't, actually. And if you want to -- we can go to Exhibit 3, probably present this to you pretty easily.
A. Which page?
Q. Well, give me a second. We're going to do this on the screen here.
Here we go. If you take a look at the screen in front of you.
A. Yes.
Q. So, this is your report, Exhibit 3. It's 99 pages long, right?
A. Yes.
Q. If you do a word search for the word

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"birefringence," it appears three times in this entire document.
Sir, if you'll pay attention to the screen, please.
A. Okay.
Q. It appears three times. The first time it appears twice in one paragraph on page 3, the word "birefringence."
Sir, can you please pay attention to the screen?
A. Yes. I will find it on hard copy.
Q. I'm telling you. It's page 3 of your report.
A. It's easier for me to read from this color copy.
Q. Okay.
A. Page 3. Yes.
Q. And what you're saying is that if you have the wrong RI value, that you will get a subdued birefringence value, correct?
A. Correct.
Q. Meaning that the relationship between RI is a relationship to the resulting birefringence calculation?
A. Correct.

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Q. Okay. So you mentioned the word "birefringence" two times in this one paragraph in Exhibit 3?
A. Yes, I did.
Q. Now, if you'd pay attention to the screen.
A. Okay.
Q. The only other time "birefringence" appears in your report is in your bibliography, in an article from 1989.
Do you see that?
A. Yes, I do.
Q. The word doesn't appear in your report in any other location. So, it is a true statement that you never articulate a criticism of the method by which birefringence was calculated by Dr. Longo, correct?
THE WITNESS: Can I answer now?
MR. HYNES: Yeah.
BY MR. BRALY:
Q. I mean, it's a yes-or-no answer.
A. My answer is: The birefringence is a secondary product -- property. It was determined by the primary property after refractive index.
Q. I agree. And that's what you said in

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Paragraph 3.
A. That's right.
Q. Yes.
What I'm asking is: You never criticized the method by which it was calculated in Dr. Longo's -- you never discussed that in your report, correct?
A. I don't have to --
Q. Just answer my question. You don't discuss that in the report, correct?
A. No.
Q. Thank you.
Your 2021 NVLAP review, the review that was done by Bo Li that you had comments about.
A. Yeah.
Q. Do you have documents pertaining to this NVLAP review?
A. You see, the review was done on the portal of the NVLAP. So first they assign me to review --
Q. Sir, I am just asking you: Do you have documents relative to the 2021 --
A. That's what I'm answering.
Q. Okay.
A. It is document in the portal of the

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NVLAP.
Q. Do you have access to that portal?
A. Of course I have access as assessor.
Q. I mean, is that something that you can download from the portal and --
A. No, we are not allowed to download it; we can only write input in the portal. And also, like once I finish my review, then the MAS, the target lab will be able to see my comments in the portal.
Q. Okay.
A. We are not allowed to print or download that.
Q. So, your comments, if I understood it correctly, was that Bo Li recognized an error had been made relative to the assignment of alpha and gamma values?
A. Correct.
Q. And that Bo Li, who was the analyst who had done that review, said essentially that this was a isolated mistake and shouldn't affect prior studies, or something to that effect, and you disagreed with that?
MR. HYNES: Misstates testimony.
A. No, no, no. It's not Dr. Bo Li. It

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is MAS --
Q. No, I understand that. I'm sorry. Let me re-ask the question, then.
A. Okay.
Q. Was it Bo Li -- that's a woman, correct?
A. No.
Q. Bo Li's not a woman?
A. A man.
Q. I'm sorry. So, Bo Li did a review, and is it correct that he concluded that this was an isolated error that should not affect prior reviews, and you disagreed with that?
MR. HYNES: Misstates testimony.
A. I don't think you express that correctly.
Q. Okay. Please do.
A. Let me say.
Q. I appreciate it.
A. First, Dr. Bo Li did the assessment by remote, because during pandemic he could not physically present at the lab; however, he identify we don't use isolate or not, we only use its nonconformity or not. So, nonconformity means in this requirement what the lab did, did not comply

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with the requirement by NVLAP; therefore, it was identify as nonconformity.
Q. Okay.
A. So, after his assessment, the lab, all they need to do is to look at are there nonconformity or not; if there are, they are required to respond to NVLAP. Okay. Whether there's nonconformity is how they are going to correct that, the corrective action, also the cause of the root cause analysis, why I made this mistake.
The third thing they need evaluate, whether this has impact to the past analysis. If it is, the lab is supposed to inform the customer of previous analysis about the impact, the mistake they made. Yeah, that is the NVLAP procedure and the policy.
Q. Okay. So if you're going to answer my question, I would appreciate it.
Did Dr. Bo Li find -- I mean, was this ruled to be an isolated incident?
A. Dr. Bo Li --
Q. Just answer my question: Was this an isolated incident? Was that the determination of NVLAP?
A. No, it is nonconformity; it's not

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isolate incident.
Q. It was a nonconformity from one evaluation?
MR. HYNES: Can we go off the record for one second?
MR. BRALY: Yes, it'll be fine.
(Discussion held off the record.)
BY MR. BRALY:
Q. Dr. Su, I just want to understand this issue a little bit better because I don't have the access to the documents that you do. Okay? So you're saying that there was a comment made about a nonconformity --
A. Excuse me. Could you repeat the question, please?
Q. Yeah; I just want to understand. So, there was a review of the lab, right?
A. To be exact --
Q. No, no, no. I'll re-ask it.
A. No.
Q. I don't want a long answer. Let me try to understand this: There was a nonconformity found with the lab, right?
A. By the assessor.

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Q. Okay. And then there was a report issued, correct?
A. What do you mean, "report issue"?
Q. What happened after the nonconformity was found?
A. The lab has 30 days to respond to NVLAP.
Q. Did they respond?
A. They did.
Q. Okay. And did you, in turn, issue your own comments in response to MAS's initial response?
A. Yes, I did.
Q. Okay.
A. I was assigned by NVLAP to review their response.
Q. Okay. And it's your review of the response where you are saying, in your opinion, that calls into question everything that they've done by PLM up to that point, correct?
A. Only for that specific nonconformity.
Q. Okay. And that specific nonconformity was -- how would you characterize that nonconformity again?
A. They switch the alpha and the gamma

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in their bench sheet. Of course that affect the report.
Q. Sure.
And they switched alpha and gamma in a report in the bench sheet, correct?
A. I am not Dr. Bo Li. If it's only in one bench sheet, you are not supposed to identify that nonconformity. It is a nonconformity-ing in any of their bench sheets.
Q. Doctor, here's the problem I have: You've reviewed probably close to a dozen PLM reports by MAS where gamma is in excess of alpha in their values. They clearly did not switch them.
A. Which report?
Q. Any of the dozen or so Johnson & Johnson PLM reports that you've reviewed.
A. After that.
Q. Well, a lot of those were dated before '21; were they not? A few of them?
You didn't notice in any of the Johnson & Johnson reports that MAS had flopped the gamma value and the alpha value such that alpha exceeded gamma, correct?
A. No, because I was asked to review the assessment report in 2021; therefore, I only review

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their response to the noncomformities identified by Dr. Bo Li. It's nothing to do with their talc Johnson & Johnson Baby Powder analysis.
Q. I'm counting up more than a dozen reports prior to March of 2021 that are on your Exhibit B that you reviewed, PLM reports that MAS did.
I just want to make sure I'm clear about this. You are not saying that in any of those reports that MAS made a systemic mistake of flopping alpha and gamma, correct?
A. Correct.
Q. Okay. That's all I needed to check.
A. Okay.
Q. As it relates to the bentonite issue, if the only two mixtures in that sample were bentonite and Calidria talc -- that's terrible. Look at me making mistakes. I'm making mistakes.
Going back to the bentonite sample, if the only two mixtures in that sample are bentonite clay and Calidria asbestos --
A. Okay.
Q. -- what is the particle that's in those images, if not asbestos?
MR. HYNES: Incomplete hypothetical;

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assumes facts.
A. Well, the only conclusion about that particle is by their own data. See, they document that refract index of each particle, and those value don't conform to Calidria chrysotile.
Q. I 100 percent understand what you're trying to say, 100 percent get you.
A. Okay.
Q. My question to you is: If the only substances in the mixture being looked at are bentonite clay and asbestos, then what is it? Do you have any idea what that particle is that appears in those images?
MR. HYNES: Same objections.
A. If I am asked to make a determination because their data showed it is not; however, if I was asked to confirm whether the identification is correct or not, whether it is the Calidria chrysotile, I would have to analyze the sample myself.
Q. So, you don't know what it is?
A. Before I examine that.
I only know that from their report. From their report, it's not.
Q. Right.

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Wouldn't it -- I mean, so, let's talk about the scientific method for a moment. All right?
A. Okay.
Q. If you're coming to -- if you're wanting to figure out the refractive index of a previously uncategorized mineral. Okay?
A. Okay.
Q. And you have a known sample of that mineral, and you conducted an analysis to figure out what the refractive index of that mineral would be.
A. Yes.
Q. That's how you figure these things out, correct?
A. Yes.
Q. Okay. So, if the only two options of what is in that bentonite mixture is some mineral and bentonite, whatever the mineral is in that mixture is what is being evaluated and reported, correct?
A. Correct.
Q. Okay. You're saying it can't be chrysotile because of other data showing a lower value for refractive index, correct?
A. Let me clarify. I know your

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question, because there are only two components: One is SB 210 chrysotile, and the other is a bentonite. If it's not bentonite, what else it could be, right?
Q. That's my question.
A. Yes. That's a very good question.
Q. Thank you.
A. It all come down to very basic question, the test method -- whether you can correctly perform the test method. If MAS is capable, correctly perform the refract index measurement, it is the first criticism in my MDL report, as said, incorrect refract index measurement.
Again, this report showed they are incapable of correctly perform that procedure. If they could, then they would not make the mistake. The refract index should be correctly measured, documented.
Q. Okay. When did you and Mr. Hynes get together to talk about your testimony relative to the bentonite clay issue?
A. No, we have not talk about that.
Q. Come on, now.
A. No.

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Q. Come on. You've been so straightforward with me for the last couple days.
You guys didn't talk about your bentonite clay opinions before you came in here?
A. You see, I only got this formal copy yesterday. And when I looked at, the first thing I check is all the information in this exhibits.
Q. Yeah.
A. I am fully capable to form my opinion. I don't have a consult with anyone. You see, this a very simple task, whether this micrograph showed it is Calidria chrysotile, because my answering last time it was, now I realized it was not.
Q. Okay.
A. You see, I don't -- really don't have to consult with anyone about this.
Q. All right.
A. Okay? Yeah.
MR. BRALY: Kevin, are the tabs that are on that, are you including that as part of what you're producing?
MR. HYNES: We should. It looks like --
THE WITNESS: I just write down the

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value.
MR. BRALY: I know. It's fine. I want to make sure we have a record of what it is he tabbed.
With that, I can pass the witness.
MR. HYNES: Give me --
MR. PLACITELLA: I've got a couple of minutes.
MR. HYNES: Okay, Chris. Go.
RECROSS-EXAMINATION BY MR. PLACITELLA:
Q. I know I'm standing between everybody and lunch, so, I'll try to be two minutes.
Can we go back to Exhibit 42, please. That's the exhibit I was asking you about before.
MR. BRALY: 42 is the exhibit about wet-sieved talc.
MR. PLACITELLA: Oh, what's the one --
MR. BRALY: If you're looking for the J4-1, that's 44.
MR. PLACITELLA: 44. Give me 44, please.
BY MR. PLACITELLA:
Q. Let me know when you have it in front of you.

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MR. HYNES: He has it in front of him.
A. Yes.
Q. Remember, this was the document you went through that you said should not be used to determine whether there's asbestos in talc.
Do you recall that?
MR. HYNES: Objection; misstates testimony.
A. Could you say the question again?
Q. This is the document we spent some time on before, what you said should not be used to determine if there's asbestos in talc as a specification.
You had problems with it, right?
MR. HYNES: Same objection.
A. That page is for amphibole. Okay? Page 7 is asbestiform amphibole mineral by optical microscopy and dispersion staining.
Q. Okay.
A. I think it's not applicable to determine amphibole.
Q. Okay. Mr. Hynes asked you a question about you don't know how long the specification that you're critical of was in effect.

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Do you recall that, him asking you that question?
A. No, I don't. I don't know which year it is, so, put out, so --
Q. Can you go to the very first page.
A. Okay.
Q. All right. Now go to the second page.
A. Hold on. Okay.
Yes.
Q. See where it says "copyright 1971" all the way through 1990?
A. Correct.
Q. Does that give you some information about how long this specification, or some version of it, was being used?
A. Correct.
Q. That's all the questions I have. Thank you.
MR. BRALY: I think you might be through.
Mr. Garde, do you have any questions?
MR. HYNES: I don't think Mr. Garde has any questions. All right. Let's go off the record.

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(Deposition adjourns: 12:58 p.m., Eastern Standard Time.)

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I CERTIFY that the foregoing is a true and accurate transcript of the testimony and proceedings as reported stenographically by me at the time, place and on the date as hereinbefore set forth.

I DO FURTHER CERTIFY that I am neither a relative nor employee nor attorney or counsel of any of the parties to this action, and that I am neither a relative nor employee of such attorney or counsel, and that I am not financially interested in the action.

Andrea Nocks CCR CRR

ANDREA NOCKS, CCR, CRR
Certificate No. X100157300
Certificate No. XR00011300

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Federal Rules of Civil Procedure

Rule 30

(e) Review By the Witness; Changes.

(1) Review; Statement of Changes. On request by the deponent or a party before the deposition is completed, the deponent must be allowed 30 days after being notified by the officer that the transcript or recording is available in which:

(A) to review the transcript or recording; and

(B) if there are changes in form or substance, to sign a statement listing the changes and the reasons for making them.

(2) Changes Indicated in the Officer's Certificate. The officer must note in the certificate prescribed by Rule 30(f)(1) whether a review was requested and, if so, must attach any changes the deponent makes during the 30-day period.

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